NAME:_____

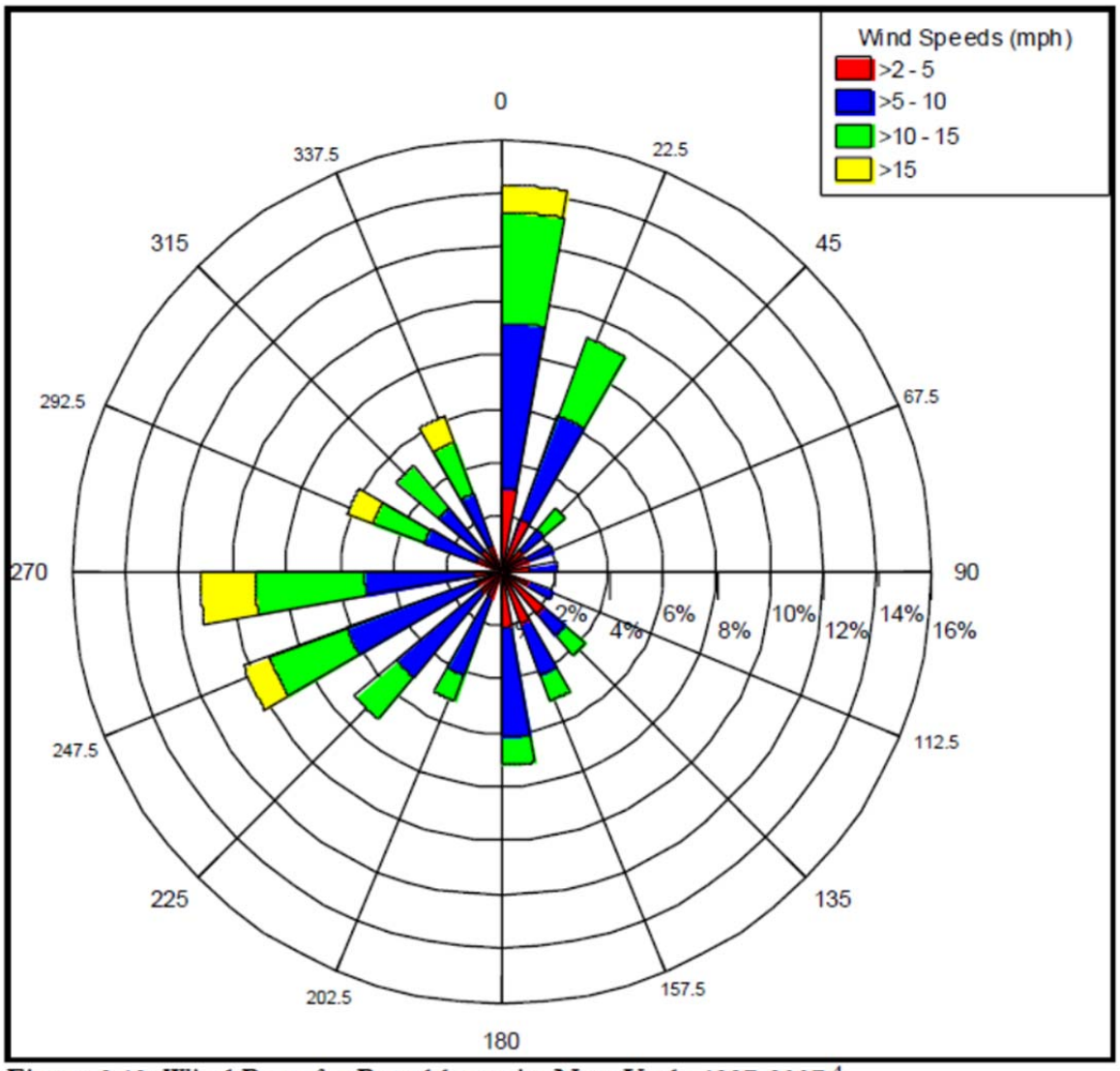

Figure 2.12: Wind Rose for Poughkeepsie, New York, 1997-2007.[4]

The Wind Rose for Poughkeepsie is a diagram that summarizes the direction and speed of the wind at this location summarized for the period from 1997-2007. The numbers around the outside edge of the circle represent compass points. Think of the rose as a compass sitting on the ground with 0^{o} (degrees) due NORTH. Answer the following questions about the representation of the directions on the wind rose.

1. What name would be given to the direction at 180^{o} _south__ What name for 270^{o} __west____
2. What Number would represent a wind from the SW __225^{o}____ and SE __135^{o}_____
3. What letters would you ascribe to a wind from 247.5^{o} __WSW____ and 22.5^{o} __NNE_____

Examine the concentric circles inside the Wind Rose. They represent the percentage of the time that the wind blows from that particular direction. For example, the wind bar for 22.5 (NNE) extends from center of the rose to just before the 5^{th} circle, which represents 10%, so the wind at Poughkeepsie comes from the NNE about 9% of the time. The wind blows from DUE EAST (90) at Poughkeepsie only about 2% of the time.

NAME:_____

When meteorologists talk about wind direction, they are talking about the direction FROM WHICH THE WIND BLOWS. A north wind blows from the north to the south. A northeast (NOR'EASTER) wind blows from the northeast to southwest. Answer the following questions about wind direction.

1. At Poughkeepsie, what percent of the time does the wind blow from due west? __11%__
2. From what direction does the wind blow the greatest percent of the time? ___north (14%)___
3. From what direction(s) does the wind blow least often? east north east(ENE) - 67.5^{o} 2%
4. What percent of the time does the wind blow from the SW, SSW and WSW together? 7+5+10= 22 %_____

If you were to add up all of the directions you would find that they do not reach the sum of 100%. The reason for this is the fact that the wind is often "calm". There is no direction from which the wind blows during calm periods because there is not enough wind to measure.

The color bars in the Wind Rose refer to the speed of the wind in miles per hour. You can determine the range of speeds along each direction bar. For example the NORTH wind blows at a speed of between 2 and 5 mph (the red portion of the bar) about 3% of the time and between 5 and 10 mph (the blue portion of the bar) about 6% of the time. The percentage of time the winds from the NORTH blow greater than 15 miles per hour is about 1%.

Wind roses are used in many ways. They help airport developers know how to lay out runways. An airplane takes off into the wind, so if the prevailing winds are from the North, runways should be oriented north to south. Wind roses also help us to identify the sources of pollution. In Poughkeepsie, our precipitation is abnormally acidic because much of our air comes from Pennsylvania and Ohio, which have many coal burning power plants. Which direction is Pennsylvania and Ohio from Poughkeepsie?

The City of Poughkeepsie sits at a latitude that places it in a wind belt called "The Prevailing Westerly Winds." Are the Prevailing Westerlies from the west or from the east? The fact that they the winds are called prevailing indicates that it occurs most of the time. Most of the time they blow from the south west. The further the distance from the equator the more variable the winds become. The further away from the poles you get the more variable the winds become. The latitudes equidistant from the poles have the most variability. Since the earth is inclined on its axis, our planet has seasons. This affects the differences in heating and cooling of various latitudes and this also changes the direction of the winds.